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AGRICULTURAL EDUCATION

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I. AGRICULTURE IN THE COLLEGES.

THE WORK OF THE COLLEGES DURING THE WAR.

The agricultural colleges held a unique position in their relation to the Nation's security during the war period. Associated in a strong organization, united in a common purpose, and with a direct connection with the Federal Government, these institutions, without a moment's delay, began to function in the Nation's gigantic program of winning the war. Students withdrew from the colleges at first for enlistment in the military service and later through the operation of the draft, thereby relieving the institutions of much of their regular responsibility.

Most of the agricultural colleges, through cooperation with the War Department, conducted short vocational courses for the special training of men for various kinds of work in the military service. Although later on they undertook, along with most of the other educational institutions, the more pretentious kind of the training in connection with the Students' Army Training Corps, they from the beginning of the war turned their attention almost wholly to increasing the food supply. Of those members of the several faculties who did not enter the military service many were detailed to the Federal departments for special duty and others were assigned to the extension divisions of the colleges.

From the standpoint of agricultural education, therefore, the colleges of agriculture failed to function during the war period. It is generally conceded, however, that the influence of these institutions during the previous half-century, coupled with that in the food production program during the war, was an important factor

in the Nation's great achievement. In the first place, through the researches of these institutions, there had become established a ground work of knowledge concerning economic food production that was of inestimable value during the war. Secondly, through the efforts of these colleges, thousands of intelligent leaders had been developed for the rural communities, each of whom served as a powerful stimulus when the emergency came. Lastly, through the organized extension activities of these institutions, extending to the remotest corner of the several States, millions of farmers were enabled to obtain and apply the most approved agricultural practices and methods of management and they were enabled to work in harmony with the well-conceived, Nation-wide program for increased food production.

PROBLEMS FOLLOWING THE WAR.

Those who expected a prompt return to normal conditions in the agricultural colleges following the cessation of hostilities have been disappointed. The problems of readjustment have been many and in some cases very serious.

Increased enrollments.—The outstanding problem in most of the colleges following the war was that of accommodating the greatly increased number of students applying for admission. Most colleges, even before the war, had reached the limits of their capacity, and to find room for those students whose registration was deferred on account of the war, along with those who would normally apply for admission, constituted a real problem. In some institutions, especially those located in the open country and in the small towns, the problem was to find living quarters. In other colleges, inadequate classroom and laboratory facilities constituted the chief difficulty. In still others, the lack of a sufficient number of teachers developed into a serious situation. In many cases all of these problems presented themselves, resulting in situations never before confronted. The dean of the college of agriculture in one of the Middle Western universities sums up the situation at his institution as follows:

> We have been caught with a greatly increased attendance and a decreased faculty, and it has been a case for the last year of meeting situations as best we could from time to time. We have about 35 vacancies on our faculty which we can not hope to fill, and the result is that we are not only unable to do new things but we can not do the old things as well as heretofore.

Inadequate support.—Closely related to the problem of taking care of the greatly increased number of students is the problem of support. The marked shrinkage in the purchasing power of the maintenance appropriations has created a situation in which all of the colleges are seriously concerned. While most of the institutions have suffered from their inability to buy the regular amount of supplies, this feature of the problem has not been so generally alarming as

that resulting from the inability of the institutions to retain their faculty members. The quality of service rendered to commerce and industry by college professors and instructors during the war has led commercial and industrial concerns to look to the higher institutions for men of superior ability, resulting in the loss to the service of many of the best teachers and investigators. Administrators in this connection are eager to explain that these men have not really left from choice but in most cases have been forced out by the inability of the institution to pay them salaries sufficient to support them and their families in reasonable comfort. It has been pointed out also that a more complete disruption of the several faculties has been prevented only by the spirit of consecration and the ardor of institutional attachment displayed by many members of the teaching force, especially those who were not wholly dependent upon their salaries for support.

In several States maintenance appropriations were increased sufficiently to provide for a general advance in salaries, but in many cases such increased appropriations were barely sufficient to take care of the increased expense resulting from the advance in the cost of supplies and equipment. In many institutions a conspicuous curtailment in the purchase of supplies was necessary to provide for the increase of salaries of individuals whose services could scarcely have been spared. In some cases, also, building operations have been postponed in order that all available funds may be devoted to the increasing of salaries. Several institutions, to meet their legitimate obligations, have created deficits with the expectation that their respective legislatures would provide the necessary funds at forthcoming sessions.

Twenty colleges, out of 35 reporting, made general advances in salaries during the biennium. Such advances range from 10 to 30 per cent. The colleges of Colorado, New York, South Carolina, and Tennessee have reported 30 per cent advances for full professors and proportionate increases for teachers of lower rank. New Mexico reports an average advance of $200 and Oklahoma $400 for teachers of all ranks. Florida and Maine report a flat increase of $300 for full professors and proportionate increases for teachers of lower rank. Wisconsin reports average increases of from 15 to 27 per cent according to rank.

The high cost of building construction.—A few of the colleges have been able to make some progress in new buildings and other permanent improvements. In many cases the funds that have been appropriated for such purposes have been held with the hope that the cost of building would decline. Several institutions report that so rapid has been the advance in building costs that appropriations based upon estimated costs were entirely inadequate to meet the needs, making it necessary to hold up building operations until additional

appropriations can be obtained. Among the more conspicuous appropriations reported for new agricultural buildings are the following: Alabama Polytechnic Institute, $125,000; Connecticut Agricultural College, $226,455; Rutgers College of New Jersey, $75,000; New York State College of Agriculture, $44,000, and $3,000,000 for a building program extending over a number of years; South Dakota State College, $210,000; University of Tennessee, $300,000; University of Wisconsin, $49,000.

CHANGES IN ORGANIZATION.

With the increase in growth and in the growing complexity of the activities of the colleges of agriculture has come a realization that the question of organization of curricula and general supervision of instruction has not received the attention that it deserves. Several colleges during the past year or two have attempted to solve this problem by the appointment of an officer as director of instruction, coordinate with the director of research and the director of the extension service. The New York State College of Agriculture and the University of California are among those which have recently adopted this plan. In the latter institution, the appointment is regarded as temporary; the idea being that it may be passed around from year to year among other members of the faculty of agriculture. The functions of such an office vary with the institution but generally include the study and coordination of curricula, the qualifications of instructors, and the improvement of instruction in general.

There is a tendency in some of the colleges, also, to extend the responsibility of the directors of instruction, research, and extension, respectively, throughout the whole institution. The Alabama Polytechnic Institute and the University of Maryland have recently adopted this plan. The object of such a plan is to insure properly coordinated programs of teaching, of research, and of extension. Extension and research activities are gradually extending beyond the limits of the agricultural division, and such a plan as this insures closer cooperation between divisions.

IMPROVEMENT OF INSTRUCTION.

Unusual interest has been manifested among agricultural faculties, particularly during the past year, in the subject of improvement of instruction in the colleges. Evidence of this fact is found in the character of the discussions at the Springfield meeting of the Association of Land Grant Colleges. Dean R. L. Watts, of the Pennsylvania State College, at this meeting described an experiment in the professional improvement of college teachers. The services of an expert educator were procured to conduct a 10-lecture course for members

of the faculty of the Pennsylvania State College. The course included instruction in the methods of organizing courses, of maintaining interest, of measuring results, etc. Attendance was entirely optional. At first many of the faculty members were skeptical concerning the outcome, but as the work progressed the interest became intense, and all members of the class agreed that the results of the experiment were highly valuable.

Dean W. W. Charters, of the Carnegie Institute of Technology, addressed the association on the subject of "Improvement of College Teaching." This address was a forceful plea for the general adoption of the problem method in teaching. He pointed to the fact that the method was not new, for it had been successfully applied to the teaching of law for many years. He declared that it was this method, known in law education as the "case method," that revolutionized education in law.

Many speakers called attention to the need for introducing more technical courses during the first two years of the four-year college course in agriculture. The belief that courses in general chemistry, botany, zoology, and geology should be regarded as prerequisite to all technical courses in agriculture is gradually giving way to the belief that the educational process is facilitated by giving instruction in the concrete in advance of the abstract.

The general appreciation of the need for greater attention to the question of improvement of instruction has been shown by the effort on the part of the colleges to create an office for the specific purpose as described under the preceding head.

MODIFICATION IN CURRICULA.

That there is a growing need for a more general training in agriculture and country life than that offered in many of the colleges, especially those having a liberal elective system, is shown by the results of a study made by the Bureau of Education's advisory committee on agricultural education.

The present is regarded by many as a transition period in which much of the technical instruction given in the first and second years of the college curriculum will gradually be pushed back into the secondary school curriculum. That progress is being made in this direction is shown by the following statement from the 1920 announcement of the University of California:

> Three new courses in general agriculture, one each in agronomy, animal husbandry, and horticulture, will be offered and may be taken as elective work throughout the freshman year and the first term of the sophomore year. Students who have completed satisfactory high-school work in agriculture will not ordinarily take these three college courses and will therefore have more time for other college work.

During recent years there has been a disposition on the part of a number of the larger colleges of agriculture to allow students the greatest freedom of choice in the matter of specialization. Students have not only been allowed to specialize in subjects like animal husbandry or horticulture, but in many institutions they have been permitted to carry their major work in such narrow lines as horse raising, sheep husbandry, fruit growing, vegetable growing, plant breeding, microbiology, soils, etc. It is interesting to note a decided reaction toward the limitation of specialization. The University of California, for example, has reduced the number of major subjects in the college of agriculture from 17 to 6. In keeping with the same general policy this institution has stricken 40 courses from the list offered by the college of agriculture. The instruction contained in these courses is now organized in 18 new courses, making a net reduction of 21. It is the belief of the authorities that this reorganization of instruction will obviate excessive duplication and reduce the number of small classes and prevent overspecialization.

On the other hand, many colleges continue to introduce new courses to meet the advanced requirements of professional groups. The New York State College of Agriculture, for example, has recently introduced specialized courses for fertilizer salesmen, poultry judges, and bee-keepers. The University of Wisconsin also has introduced specialized courses for boys' and girls' club leaders, and for county demonstration agents. Such courses, however, have a definite aim, and taken with other related courses in the curriculum serve to make the instruction more comprehensive rather than to restrict its scope.

There is also a tendency on the part of the colleges of agriculture to require more work in economics and sociology, and to bring about a closer relationship between the instruction in economics and that in technical branches and more practically the instruction in farm management. The New York State College of Agriculture has united the departments of rural economy and farm management and has established a new department of rural social organization in which five new courses are offered.

The course designated "agricultural relationships," as offered last year for the first time by the Kansas State Agricultural College, is also an attempt to give the student a knowledge of the whole field of agriculture from the economic standpoint.

The one, two, and three year subcollegiate curricula, as offered by many of the colleges, are still very popular despite the rapid development of agricultural courses in high schools. The Massachusetts Agricultural College has established a two-year curriculum to meet the demand for instruction of this nature. The Connecticut Agricultural College has shortened its two-year curriculum by reducing the number of months in each session from nine to five, and has raised

the minimum age from 16 to 18 years. Although of a secondary nature, such courses meet the need of men of mature years who are not willing to attend classes with students of secondary school age. The tendency in the college is to limit more and more the enrollment in these curricula to mature students.

Agriculture for women.—Possibly as a result of the interest in agricultural pursuits developed by woman during the war, a demand has arisen for collegiate instruction for women in this subject. Some of the colleges have already responded to this demand, and many women students are now enrolled. The Massachusetts Agricultural College, for example, has introduced a limited amount of work in home economics for the benefit of young women who desire training for agricultural vocations. At the University of Wisconsin, 12 women students taking agriculture have formed an agricultural women's association.

TRAINING TEACHERS OF AGRICULTURE.

Before the passage of the Federal Vocational Education Act very few, probably not more than six, of the colleges of agriculture offered separate curricula or major options for the special preparation of teachers of agriculture. A number of institutions, however, have offered as elective some professional courses in education, but until recent years students have not manifested much interest in the subject. Previous to the year 1918, only 283 students graduated from special teacher-training curricula or major options in 38 of the agricultural colleges from which reports have been received. Since only one of the institutions which failed to report offered special opportunies for prospective teachers of agriculture, this figure may be regarded as approximately correct.

Number of students in training.—The following statement prepared from data supplied by Mr. C. H. Lane, of the Federal Board for Vocational Education, gives a fair picture of the progress in teacher training during the past two years:

In the north Atlantic region 352 students were enrolled in resident teacher-training classes during the year 1919–20, as against 247 for the previous year. In the southern territory 849 students were enfolled in 1919–20, compared with 389 for the previous year. The east-central region had an enrollment of 343 for 1919–20, as against 282 for the previous year. In the west-central region, for 1919–20, 491 students were enrolled as against 164 for the previous year. In the Pacific-coast region 275 students were enrolled in 1919–20 compared with 252 for the previous year.

In summarizing the enrollment in resident teacher-training classes it is found that there were 2,310 students enrolled during 1919–20, compared with 1,334 for 1918–19. Experience has shown that many students who take work in these classes do not become teachers. Furthermore, these enrollments represent the number of students of all years, and many of them will not be immediately available for service. In 1920, 444 students who had carried the work in agricultural education, were graduated.

Demand for teachers exceeds the supply.—Despite the increase in the number of students graduating from teacher-training curricula the demand for teachers of agriculture is insistent and far exceeds the supply. A recent inquiry revealed the fact that 465 additional teachers of agriculture will be needed for the year 1920–21. On the basis of the amount of money which will be available when the Smith-Hughes appropriation matures in 1925–26, Mr. Lane estimates that 1,135 teachers, at an average of $2,000 per teacher, will be needed if all the money is to be used. In his estimate Mr. Lane assumes that $9,071,000 will be available, and that the several States will reimburse teachers on the basis of one-third Federal, one-third State, and one-third local, in harmony with present tendencies. Estimates, based upon the probable growth of secondary agriculture, indicate the possibility of an even greater demand, and suggest that unless the colleges greatly increase their output of agricultural teachers, progress in the development of secondary agriculture is likely to be retarded.

So insistent has been the demand for teachers of agriculture that many of the agricultural colleges have been called upon to offer during the summer special training courses of from four to nine weeks' duration. Some of these courses were planned especially for supplying the needed technical information to persons who already possessed the necessary professional training and teaching experience. Others were designed for agricultural college graduates who needed professional training in education to qualify for teachers' certificates.

The teacher-training curriculum.—Along with the growth of teacher-training work in the colleges there has been a tendency to scrutinize more closely the content of the teacher-training curriculum. While a few colleges still require prospective teachers to take the regular agricultural curriculum, which requires specialization in some phase of the subject, and to carry as elective the necessary professional courses, the majority of them have provided specially adapted curricula.

There is a growing belief that the prospective teacher of agriculture should be given more instruction in rural economics and rural sociology than that generally included in the curriculum. So insistent has been the demand in some institutions for such work, that the teacher-training curriculum has been modified in various ways. In some cases the new work has been added at the expense of technical instruction; in others, the amount of humanistic work has been reduced, and in still others some of the professional courses have been eliminated. Many of the educational specialists at the institutions are now asking the question whether an additional year's work should not be required for students who plan to teach agriculture. The University of California already has taken steps in this direction and

other institutions are encouraging students to take an additional year and secure a master's degree.

The amount of work required in professional courses including psychology ranges from six semester hours, as required by the University of Arizona, to 29 semester hours as required by Clemson College. The common requirement, however, ranges from 12 to 18 semester hours. Seventy-six per cent of the colleges reporting fall within this range. The most common requirement is 15 semester hours, which is prescribed by 12 colleges. In many States the amount of work to be carried in professional subjects is prescribed by law, and in such cases the colleges aim to provide the minimum requirement. Such laws frequently were made before the training of teachers of agriculture was undertaken and were formulated to meet the needs of teachers of academic and science subjects. Since the teachers of agriculture require so much technical knowledge, many of the States have modified their laws to meet the peculiar needs of such teachers.

Several of the colleges still require the students who expect to teach to specialize in some phase of agriculture and to take as electives such courses in education as are needed to qualify for a certificate to teach. Most of the men in charge of teacher-training work in the colleges have come to believe that for the prospective teacher of agriculture a general course in agriculture is more suitable than one that is highly specialized. There has been conspicuous progress during the past year or two in the development of basic courses in the several branches of agriculture to meet this long-felt need, and at the same time to insure a broad general knowledge of the whole field of agriculture on the part of all students of the subject.

Facilities for practice in teaching.—Not only has rapid progress been made in the improvement of curricula for the training of teachers of agriculture, but great achievements have been made toward providing appropriate facilities for practice in teaching on the part of prospective teachers. The institutions have realized that practice work should be conducted under conditions as nearly normal as possible, and it has been necessary first of all to establish secondary schools of agriculture to serve as laboratories for observation and practice. Although the plans of many of the colleges for providing practice in teaching are in a formative stage, it seems advisable to record the present status in order that all may be informed concerning the methods commonly employed to meet the requirements. The nature of the facilities at present may be classed somewhat arbitrarily under four heads, as follows:

1. Practice school maintained by the teacher-training institution. Six colleges, those of Arkansas, Missouri, North Dakota, South Carolina, Wisconsin, and Wyoming, depend upon the institution's

practice school to provide facilities for practice teaching in agriculture. The University of Missouri makes use of a high school in a near-by town as well as its practice school. The North Dakota Agricultural College depends to some extent upon the short-course and other classes in secondary agriculture to augment the facilities of the practice school. It may be assumed that most of these practice schools maintain departments of agriculture, but the statements in a few cases are very vague in this respect.

2. Secondary schools of agriculture at the college. According to the returns, eight colleges, those of Colorado, Kansas, Minnesota, Nebraska, Montana, New Mexico, Oklahoma, and Rhode Island, provide for practice teaching in secondary schools of agriculture connected with the college. In the case of New Mexico, agricultural classes in the college preparatory school provide the facilities for practice. In the other cases, the work is done either in the so-called "school of agriculture" or in a regularly accredited vocational school on the campus. Such schools differ from vocational schools throughout the State mainly in that the pupils are generally older. Where collegiate methods of teaching are employed the value of these schools for practice teaching is greatly diminished.

3. One or more local or near-by high schools with agricultural departments. Twenty-five of the colleges, those of Alabama, Arizona, Delaware, Florida, Georgia, Idaho, Illinois, Iowa, Kentucky, Louisiana, Maryland, Michigan, Mississippi, Missouri, Nevada, North Carolina, Ohio, Oregon, Tennessee, Texas, Utah, Vermont, Virginia, Washington, and West Virginia, make use of near-by high schools to provide practice teaching. With the exception of Illinois, Missouri, and Ohio, the work is limited to the facilities of a single school. More or less variation exists concerning the cooperative arrangements, but in most cases a member of the teacher-training department assumes the responsibility for the work of the agricultural department, the teaching being done by apprentice teachers. Maryland University pays half the salary of the agricultural instructor of the local high school, who is also a member of the department of education at the university. The University of Missouri supplies the agricultural instructor, and the local school provides all other facilities. The New York plan includes, in addition to the adoption of the apprentice-teacher method, as described below, the use of a near-by high school in which the college supplies the teacher.

4. The apprentice-teacher plan. This plan for providing practice in teaching is followed by eight colleges, those of California, Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, and Pennsylvania. The Kansas State Agricultural Col-

lege probably will adopt this plan as soon as the need for extending facilities warrants it. The cooperative arrangements with the school authorities differ somewhat, but in general the apprentice teacher serves as assistant teacher without remuneration. In New York State, and possibly others, the apprentice receives a nominal salary borne jointly by the college and the State.

Among the 40 institutions reporting information on this subject the amount of practice teaching required varies from 20 hours to 18 weeks, full time. As nearly as can be determined from the questionnaire, 23 colleges require at least 60 hours of teaching. These are the colleges of California, Connecticut, Delaware, Florida, Georgia, Illinois, Maine, Massachusetts, Minnesota, Missouri, Montana, Nebraska, North Dakota, New Hampshire, New Jersey, New Mexico, New York, Ohio, Oklahoma, Oregon, Pennsylvania, South Carolina, and Wyoming.

From the foregoing facts it is apparent that considerable progress is being made in providing facilities for practice teaching. Eight colleges have adopted the apprentice-teacher plan; 25 colleges have arranged for practice facilities in near-by high schools in which agriculture is taught; 8 others have used for this purpose the secondary courses in agriculture on the campus; and 6 use practice schools maintained by the institution. That progress is being made is evidenced further by the fact that at least 23 colleges require a minimum of 60 hours of practice teaching.

It is evident, nevertheless, that in many colleges, especially those with large enrollments in teacher-training and with only one or two practice schools, the facilities are far from meeting the needs. In view of these conditions and for the purpose of establishing a norm toward which to aim, the committee on practice teaching of the American Association for the Advancement of Agricultural Teaching, at its Springfield meeting, in 1920, suggested certain standards which should as far as possible be attained in practice teaching. These are:

1. The teaching should be conducted with pupils who are studying vocational agriculture.

2. The amount of teaching should consist of not less than 60 actual hours.

3. The conditions under which the practice teaching is conducted should be as nearly as possible like those that the teacher will find when he accepts regular employment.

4. The teacher in training should have sufficient supervision to insure professional growth.

5. The teacher in training should have an opportunity to supervise the practical work of vocational students.

6. The community relations of the teacher of agriculture are so important that he should be expected to participate in community activities.

Research in agricultural education.—In the development of teacher-training work in the colleges attention is now being given to the need for research in agricultural education. The Pennsylvania State College in this connection makes this statement:

> We are now planning to add to our staff of the rural-life department a research professor in agricultural education. As you may know, vocational agriculture has been taught in the vocational schools of Pennsylvania for the past eight years. We feel the need of further study of our problem, and it is for this reason that we wish to carry out research as a part of our program. In the past it has been common with practically all institutions to have most of such work done by graduate students. Of course, graduate students will be working on some such problems, but we want to go much further into the matter than it is possible for graduate students to go. We shall want for this work a man whose training and experience will enable him to go into the heart of the problem and make a really constructive study of the work in agricultural education. I very firmly believe that such a study will make the largest contribution to agricultural education that has yet been made.

At the Chicago meeting of the American Association for the Advancement of Agricultural Teaching, in 1919, the following resolution relating to this topic was adopted:

> *Resolved*, That in case there are additional grants of Federal funds to the agricultural experiment stations, it is the belief of this association that provision should be made for research in agricultural education, agricultural economics, home economics, and such other subjects as pertain to the rural community.

AGRICULTURAL EXTENSION.

The following statement shows in a general way the scope and principal objectives of the agricultural extension program of the United States Department of Agriculture in cooperation with the colleges of agriculture, with particular reference to the activities of the past two years:[1]

At the beginning of the fiscal year 1918–19, the emergency appropriations, providing funds to increase production, were in force; they amounted to $6,400,000 for the employment of county agents, and boys' and girls' club leaders. However, in 1919–20 these appropriations were discontinued, and in lieu thereof Congress appropriated $1,500,000 to be used under the same conditions as the funds provided under the Smith-Lever Act. Therefore, the first problem that presented itself to the extension workers in 1919–20 was that of increasing funds from sources within the State. In 1918–19, the total funds from within the State amounted to slightly over $5,000,000, which was increased to nearly $8,500,000 in 1919–20, while the

[1] Prepared under the direction of Dr. A. C. True, U. S. Dept. of Agriculture.

amounts received from the Federal Government for these two years were $9,000,000 and $5,800,000, respectively. It is also interesting to note that of the increase of $2,800,000 within the State, $1,600,000 came from sources within the county and $1,200,000 from funds under the immediate control of the college or provided by action of the State legislature.

The second problem presented to the extension workers was the organization of the counties during 1918–19 in such a way that as many as possible of the agents could be retained, in spite of the fact that the expenses of the extension work were increasing and the funds were decreasing. This meant that the counties had to be organized, in order to carry on extension work, so that they would contribute funds necessary to conduct the work. This was accomplished rather successfully with the men agents. The counties with men agents on July 1, 1918, numbered 2,435; they decreased to 2,250 on July 1, 1919, and to 2,030 on July 1, 1920. In other words, although the number of agents increased 1,000 between 1917 and 1918, or 70 per cent, the decrease was only 20 per cent between July, 1918 and 1920.

When the war began, the work with women had not been very thoroughly established in the Northern and Western States. However, between July 1, 1917 and 1918, the number of counties with home demonstration agents in the 48 States increased from 537 to 1,715. The number of home demonstration agents on July 1, 1920, was approximately 800. This is the number that should have been if the growth had been normal.

During the war, the method of marketing agricultural products was greatly upset. There was a rapid rise in prices and an unusual demand for certain products, such as pork and wheat. During these two years, the agents were actively engaged in helping the farmers to organize, so that the latter could market their products to the best advantage. Some of these organizations are the live-stock shipping associations, wool pools, cotton-classing associations, milk-producers' associations, farmers' elevators, etc.

On account of the income tax, the farmers have been compelled to keep some kind of records of their receipts and expenditures. This has resulted in a very marked demand for farm accounting records on farms. Owing to the rapid changes of prices in many interests, the farmers felt that they were selling their products at less than the cost of production, but they had no definite records or methods of accounting by which they might verify the truth of the proposition. This has led to a demand for cooperation on the part of the extension agents with the farmers in outlining the cost of production by records which the farmers can keep, in order to defend themselves when asked for a change in prices.

II. AGRICULTURE IN SECONDARY SCHOOLS.

SCHOOLS AND ENROLLMENTS.

The development of vocational agriculture, although somewhat retarded because of the war and on account of the scarcity of qualified teachers, has progressed favorably during the past two years. The number of schools offering vocational courses in agriculture and receiving the benefit of the Smith-Hughes fund has more than doubled during the two years covered by this report. The number for 1920 was 1,375 as against 609 for the year 1918. The most conspicuous gains have been made in the Western States. In the North Atlantic group of States the number of schools has increased during this period from 166 to 219; in the Southern group from 200 to 440; in the East Central group from 159 to 433; in the West Central group from 45 to 153; and in the Pacific groups from 39 to 121. The chief reason for the difference in the rate of development may be explained by the fact that the North Atlantic States had made greater advancement during the years preceding 1918 and had nearly reached the limit of the Federal appropriations.

From the standpoint of enrollments, also, the progress during the biennium has been notable. The total enrollment in agricultural courses in the Smith-Hughes schools has jumped from 15,453 in 1918 to 31,301, a gain of over 100 per cent. Here again the greatest gains are found in the Western States, particularly those in the West Central group, which show an average increase of 165 per cent.

Among the schools considered above are 86 for colored students in the Southern States. These schools have reported enrollments of agricultural students aggregating 1,725. The fact that the agricultural work in practically all of these schools has been established since 1918 suggests that there is a rapidly growing interest among the colored people for special training in agriculture.

Agriculture for disabled soldiers.—Under the provisions of the Smith-Sears act, 7,800 men who were disabled during their military service have completed or are now taking instruction in agriculture. Only about 10 per cent of this number are enrolled in regular four-year courses at the colleges of agriculture. A much larger proportion—approximately 40 per cent—are enrolled in secondary courses, either at the colleges or at State secondary schools of agriculture. The remainder are taking agricultural instruction at certain training centers in connection with military hospitals.

PART-TIME SCHOOLS.

With the establishment of strong secondary schools of agriculture throughout the country there has come a demand for short courses and evening classes for persons who can not spare the time to attend

the regular classes of the all-day school. The colleges of agriculture in the past have given much attention to this type of instruction, especially that given in short winter courses and in summer courses. Many of them have conducted the so-called "movable school" throughout their respective States. All of these efforts have met with approval and have had a far-reaching influence upon agricultural development. The number of communities which the colleges could serve in their extension program has been limited, both from the standpoint of expense and by the number of instructors that could be made available during the season when the demand for the work occurs.

There has come, therefore, a general desire on the part of the colleges to extend their influence by establishing cooperative relationships with the local high schools in which departments of agriculture have been established. Such relationships provide for the conducting of short courses by the local agricultural instructor and for the assistance of specialists from the college. The committee on part-time instruction of the American Association for the Advancement of Agricultural Teaching has made a study of the nature and extent of part-time instruction in the secondary schools. From the information collected from a partial canvass of the conditions throughout the country, their report shows that 164 secondary schools are offering part-time instruction in agriculture. In four counties of Iowa 20 schools are giving such work. The State of Wisconsin offers opportunities in 30 schools; in New Jersey, 20 schools; in Indiana, 15 schools; in Ohio, 15 schools; in Montana, 14 schools; and in Georgia and Virginia, each 11 schools.

Concerning several classes of persons to whom this kind of instruction has been offered, and the duration of the courses for each, the committee makes the following classification:

1. School pupils in outlying school districts with a regularly employed all-day teacher or a special teacher employed for part-time work.

2. Groups of boys, usually over 16 years and under 21 years of age, who take a systematic course for three months or more during the winter, spending the entire day at school three to five days per week.

3. Groups of farm boys, usually between the ages of 16 and 21, who come in for systematic instruction for 90 to 150 minutes per day, two or three times per week. Such instruction usually is given in short-unit courses and by the regularly employed teacher.

4. Adult farmers in short unit courses with meetings once or twice a week. The courses for this group are usually quite short and the method of instruction is especially adapted to adults. The teacher usually is assisted by county agents, experts from the agricultural colleges, and others.

5. Men and women of all ages, meeting once or twice a week in evening classes. Such classes generally are conducted by the regularly employed teacher of vocational agriculture, although in some instances special part-time teachers have been employed.

A very pretentious program for part-time instruction has been instituted in Iowa, where a special organizer is employed by the State board of education for each county. Local groups are organized and a special teacher employed for each group. The organizer, in addition to teaching one of the groups, supervises the work for the whole country and follows up the home project work after the classes have disbanded.

Several other States, particularly Georgia, New Jersey, New Mexico, and Pennsylvania, have organized programs for part-time institutions, but there is a decided lack of uniformity in method. More rapid and more definite development can not be expected until sufficient time has elapsed to test the methods now in use. Several of the teacher-training departments in the colleges are now giving their attention to the problem and their investigations and recommendations are bound to have a marked influence upon the trend of extension teaching.

IMPROVED RELATIONSHIPS.

Better articulation with the colleges.—There is a growing disposition on the part of the colleges of agriculture to accept work in vocational agriculture at full value toward satisfying the requirements for admission. The faculty of the New York State College of Agriculture, for example, has adopted the following resolution bearing upon this subject:

> A vocational diploma in agriculture or home making from the University of the State of New York, or evidence of equivalent vocational training, will be accepted for admission to the New York State College of Agriculture. If the applicant does not present three units of foreign language he shall elect the equivalent amount of work in the university in one or more of the following subjects: Foreign language, English, mathematics, philosophy, psychology, history, economics, political and social science.

From the reports available it is shown that the agricultural colleges of 20 States grant full credit for the agricultural work done in approved high schools.

Better relations with the college extension service.—The contention that existed during the early development of vocational schools of agriculture concerning the respective fields of activity of the local agricultural instructors and the extension representatives of the agricultural colleges has almost passed. In most States a cooperative extension program has been worked out in which the local agricultural instructors are given a definite part. Not only does the agricultural

instructor contribute to the extension program, but the extension specialists and county agents have been of great service in the promotion of agricultural education in the schools.

A special committee, appointed by the American Association for the Advancement of Agricultural Teaching for the purpose of studying relationships of the vocational schools to the extension division of the college, reported at the Chicago meeting in November, 1919. Among the recommendations made by this committee, the following are of special interest:

That the agricultural college and vocational agricultural education be recognized as indispensable to each other. Both are desirable and permanent.

That the county representatives of the agricultural college be recognized as desirable and permanent, for the purpose of promoting effective local agricultural improvement organizations, and for the purpose of rendering semiexpert services such as, on one hand, do not require a highly specialized extension expert, and, on the other hand, such as are unusual and take care of emergencies which local instructors can not meet.

That the need for county representatives of the agricultural college be recognized for purpose of leadership, not only in senior but also in junior extension service.

That the vocational instructors be intrusted with all of the local extension work with adults which they can carry without impairment of their service as teachers and with benefit to themselves as men of sound and growing experience in the affairs of farming.

That the vocational instructor be intrusted with the local leadership of junior extension work, with the privilege of inviting volunteers to help him, but with special responsibility himself for supervision of the work of boys 12 and 13 years old.

That frequent conferences be held jointly by extension and vocational workers for the discussion of policies and for the gradual perfecting of State and local team-work programs.

IMPROVEMENT OF TEACHING.

The necessity in many of the States for employing substandard teachers during the early development of agricultural work in the secondary schools, and especially during the period of the war, has emphasized the need for close supervision and for the professional improvement of teachers while in service. As a result, 36 States have employed special agricultural supervision on full time. In the remaining 12 States such an officer has been employed for part time only. The number of full-time supervisors has been increased by 16 over that for 1918-19.

In addition to providing for supervision, 22 States have employed, either on full or part time, special itinerant teachers for the express purpose of training teachers while in service. The provisions for this type of work vary with the State. In some cases the itinerant teacher-trainer is maintained by the college of agriculture and constitutes an effort to follow up the work of their graduates who have entered the teaching service, although their efforts are not generally limited to their own graduates. In other States the itinerant teacher-training is supported by the State department of education. Massachusetts, which was one of the first to adopt this plan, belongs to this class, but here the work is centered at the college.

Professional training on the part of teachers is not a prerequisite to employment in this State, but men teachers who usually come with a broad technical knowledge are professionally trained by the project method. The task of training such men varies according to the needs of the individual. The program generally includes (*a*) personal assistance after installation; (*b*) special courses at the college planned to meet the needs of special groups; (*c*) professional improvement projects; and (*d*) follow-up work in the field.

Unlike the agricultural supervision, the teacher-trainer generally does not carry authority to enforce special methods. On the contrary, he goes about in the spirit of helpfulness. In this way he is able to establish intimate relations with the teachers. He soon becomes familiar with the peculiar weaknesses of the several teachers and is able to prescribe special training to meet the peculiar needs. He also becomes familiar with the local problems and is often able to straighten out difficulties that to the agricultural instructor might have been embarassing.

This work of itinerant teacher training, while primarily established in several States as an emergency measure to make up for the deficiencies of the teachers, has proved to be so effective that it is now generally regarded as a permanent part of the program for the development of agriculture in the secondary schools.

Various other plans have been developed for the purpose of improving the efficiency of the teachers. Some States, especially those in the west central region, have depended mainly upon frequent conferences. Such conferences furnish opportunity for discussing methods in use and for making plans for future work. Other States have pinned their faith to monthly information service leaflets. Twenty-six such leaflets, in either printed or multigraph form, are now in circulation.

IMPROVED METHODS OF INSTRUCTION.

Supervised practice.—The adoption of the home-project plan, or what is now more commonly known as the supervised practice plan,

as an adjunct to secondary education in agriculture, has been general, especially in schools receiving aid from the Smith-Hughes fund. It is encouraging to note that during the past two years conscientious efforts have been made to improve the plan and to correlate the practice work more closely with the classroom instruction. It has been observed that there is a remarkable relationship between the financial return from the home project and the educational return from the whole course. Since the development of interest is one of the most important factors in educative process, it is natural for the students who are successful in their farm enterprises to derive the greatest benefit from their courses. Teachers and supervisors are emphasizing more and more the importance of selecting home projects which are likely to prove profitable. They are unanimous in their belief also that careful records should be kept of all transactions and that statements showing the earnings from each project should be required of all students.

Both as an indication of the educational benefit of the training and as an indication of the direct economic value of the work, it is interesting to note that for the past year the total financial return from the supervised practical work in 38 States amounted to $526,122.43, as reported to the Federal Board for Vocational Education. Other States have depended mainly upon professional improvement courses at the college during the summer. Many States, of course, have employed two or more of these special methods and several have employed every known means for improving the quality of instruction.

Reorganization of curricula.—The subcommittee on agriculture for secondary schools of the Bureau of Education advisory committee on agricultural education, at its meeting on March 7, 1919, made the following recommendation:

1. The immediate attention of the committee is to be restricted to formulating vocational courses of the occupational extension type, that is vocational courses which are predicated upon the assumption that the pupils who are to take these courses have a background of farm experience and have an opportunity for extending and continuing that experience in connection with the instruction.

2. The subject matter to be used in making up courses is to be formulated as units, such as bean growing, potato growing, apple growing, pig raising, farm butter making, etc.

3. Courses of instruction of varying lengths and varying content may then be made up by combination of units. This would in a measure overcome some of the difficulties attendant upon an attempt on the part of the committee to formulate a uniform course of study which would in any way be suitable to the varying conditions in the United States. The particular units to be combined for any course

would depend upon such factors as the farming of a locality and upon the amount of time which is to be given to such instruction. State and local authorities will determine suitable combinations of units for given localities.

4. In organizing the subject matter of these units the production order, in general, will be followed rather than the so-called logical order usually followed in textbooks on agriculture.

5. These units will set forth the practical procedure together with such information as is necessary to carry out good practices. Parallel with this there will be an arrangement of the science content which underlies and can be correlated with such practices. In the field of crop production, for instance, practically all of the fundamental science involved in crop production can be correlated with any one of the crop units.

6. Certain of these units will be put up in two forms: (1) A short unit, to be used in sections where that particular phase of agriculture is incidental or a minor; and (2) special units, to be used in those sections where that line is a major or a specialty.

7. The best prepared men in the country will be requested to write these unit courses. In order to secure definiteness of aim and uniformity of arrangement of content, it is suggested that the subcommittee be instructed to draw up detailed specifications in harmony with the foregoing statements for the preparation of these units.

8. The subcommittee feels that whatever may be put up in the way of content there should be very carefully worked out by the subcommittee a statement of principles which should govern the arrangement and methods of teaching these units.

In harmony with recommendation seven, several persons have undertaken the development of unit courses based upon the results of an analysis of the particular enterprise selected. One on poultry raising and another on swine raising are being worked out by specialists in the department of agriculture. Others on various subjects have been prepared in the department of agricultural education of the Kansas State Agricultural College. An exceptionally well-developed course on sheep raising has been developed as a thesis in partial fulfillment of the requirements for the degree of doctor of philosophy, by Dr. J. H. Green, of the University of Illinois. Prof. C. B. Waldron, of the North Dakota Agricultural College, under the direction of Dean R. W. Selvidge, of the University of Missouri, has developed along similar lines a course on general agriculture.[2] This course is one of a series prepared for use in Army posts, but is worthy of more general adoption. It is based upon what is known in the Army as the applicatory method of

[2] U. S. Army Educational Manual No. 10, 1920.

teaching. The peculiar value of this method, as claimed by those responsible for the training of men in the military service, is that it develops "coordination of mind and body and ability to think quickly and independently in emergencies."

III. AGRICULTURE IN THE RURAL ELEMENTARY SCHOOLS.

The development of a rural school program based upon the interests of the child and upon the life of the community has been the dominant aim of the leaders in rural education during the recent years. Various plans have been suggested to bring about this result, and several interesting experiments are under observation. In general, the plans proposed are lacking in definiteness and for this reason teachers are slow to adopt them. Since communities differ in their interests, there are bound to be differences in detail; but when the teachers, who are to take the responsibility for teaching in the rural schools, are started out with this ideal and know how to analyze the life of the community and discover therein the materials which may be used for agricultural instruction, we may hope for rapid progress in this direction. Many of the normal schools are now beginning to specially prepare teachers for teaching in rural districts. They are becoming more conscious of the educational needs of the rural community and are endeavoring to turn out teachers with the proper attitude toward rural life and possessed with a determination to help in the upbuilding of the rural community.

With a view to helping teachers analyze the life and affairs of their respective communities, the University of Wisconsin has issued a pamphlet entitled "Social Surveys of Rural School Districts."[a] The author, Prof. C. J. Galpin, in recommending the survey method of obtaining information about the community, has this to say:

> Sowing the seeds of civilization in the hearts of the children is doubtless opportunity enough to call forth the best that is in you. But suppose over and above this rare inducement to your labors you could take a hand in the material development of your State and see the results of your work maturing from year to year while you are waiting for education to blossom in the spirit of the children. This is precisely the challenge put up to you in the plan set forth in this circular. . . .
>
> It is the purpose of this publication to show how to mobilize the intimate facts of farm life which surround you; how to utilize these facts so as to produce community growth.

The modification of the rural curriculum to meet the needs of the rural people necessarily means that more attention must be given to agriculture as the dominant interest of rural communities. In other words, farm life must form the basis of the course of study.

[a] Extension Service of the Department of Agriculture, Circular 122, 1920.

At the 1919 meeting of the National Education Association, Prof. G. M. Wilson made a statement which fairly expresses the belief of many of the leading educators concerning the changes in the curriculum and the methods of teaching which must prevail if the rural school is to function properly in the life of the people it is intended to serve. After indicating how the methods of teaching some of the traditional subjects will need to be changed to meet these new requirements, he states:

> This will mean a decided saving in time, which can be used in a more thorough mastery of the processes which are useful and fundamental, or for other purposes. In short, there must be a positive program of studies that is based squarely upon pupils' interests, community relationships, and the functional conception of education. It means that the purposes of education must be accomplished rather than that subjects as such shall be taught. The program of work must be broadened to include the vocational type. The old studies which, because of their handling, have not served the aims of health, citizenship, and education for leisure, must be recast to serve these aims, and in addition, vocational efficiency and effective home membership must be realized through new material which shall be organized into the curriculum. The result of this reconstruction of the course of study will be an entirely different product. Not a pupil stuffed with facts, dissatisfied with rural conditions, and unable to realize the larger aims of education; but instead an individual who thinks in terms of the problems of present-day life, has at hand the tools and the methods for their solution, is thoroughly in sympathy with his environment; and is an exemplification of the recognized educational aims, health, good citizenship, vocational efficiency, and the right use of leisure.

The reorganization of the rural school curriculum on this basis is bound to be a slow process. The number of schools in which the curriculum is centered around agriculture and country life is extremely small. The chief retarding factor is the difficulty of securing teachers who are qualified to teach by any other than traditional methods. Some conspicuous results, however, have been obtained, largely through the efforts of certain leaders in the training of teachers while in service.

The four-year rotation plan.—The results achieved in certain counties of Missouri have attracted considerable attention. The following extracts, taken from a bulletin issued by the county superintendent of schools of Nodaway County, briefly describe their four-year rotation plan for teaching agriculture in rural schools:

> The word "agriculture" as used in our county refers not only to the subject directly pertaining to farming but also to anything pertaining to the life and welfare of the children and the people of the community—health, sanitation, home conveniences, social conditions, and community interests. In fact, it includes anything which enables us to teach in terms of the lives of the people and the needs of the community. It is really vitalized rural life.
>
> *Teach growing things.*
>
> First year. Farm crops; how seeds grow; depth to plant; corn; oats; alfalfa; weeds; gardens; canning; drying.

Making things.

Second year. Making nail box, wash bench, book rack, etc.; rope knots; splicing rope; cement tanks, steps, and posts; farm tools and machines; removing stains; sewing.

Live things.

Third year. Animals; diseases and remedies; how to feed; testing milk; poultry; useful birds; insect pests; setting the table; hot lunch.

Soil and home.

Fourth year. Soil fertility; cultivation; moisture; sanitation; beautifying the home; social and community work.

We study the silo, feed, grain, garden, preserving crops, birds, pictures, home conveniences, and serving hot lunches from the standpoint of what each community is doing and what can be done to make things better. This gives a motive for our work, a reason for reading, a reason for arithmetic, a reason for writing letters. We study the things themselves, we let the children themselves do the things we want done.

The clever teacher, under our old system, had the boy figure the contents of a haymow in order to fix in his mind certain principles of arithmetic. This is teaching arithmetic in terms of the life of the boy. It is good arithmetic, but it is not yet good living.

Under our new system the boy figures the contents of the haymow because he or his father wants to know how much hay there is and how long it will feed their dairy herd. This is studying real things and using the arithmetic to help the boy find out something he wants to know.

When the four years' work is finished we will start in again with the first-year's work. By this time the older pupils will have graduated and the work will be new again to both teacher and pupils. This plan makes it possible for us to give the pupils more agriculture; keeps the work live and real and vital; and makes it easier for us to supervise the work. It is relatively easy for us to train our teachers for one line of agricultural work each year, while it would be impossible for us to train them for all lines of work.

How the work was started.—Our county was 1 of 15 in Missouri, selected by former State Supt. Uel W. Lamkin, to try out the rotation plan. Under the direction of the State department of public instruction, and Prof. P. G. Holden, the county superintendents received a week of intensive training at Jefferson City, Mo.

Acting upon their suggestion we started with only a small group of teachers. It was a new thing, and we were urged to begin with a group small enough so that we could carefully supervise the work and give the scheme a fair chance.

We chose five capable teachers whom we judged were teaching in communities progressive enough to try out a new thing—the community was considered as much as the teacher in making our selections.

Before beginning the work the teachers had the benefit of a week's training under the same direction as the county superintendents.

Much of the success of this work is due to the regular weekly conferences we held with the teachers who were doing the work. In these conferences we did the very things that we expected the children to do. We went to the fields, determined the stand of corn, compared the yields of fields where the stand was good with the fields where the stand was poor, and figured out what it meant in dollars and cents.

All of this was extra work for the teacher, and we warned the teachers that they should not go into this work if they were looking for a soft snap. The common consensus of opinion with this group of teachers was that the work was hard but that the interest, enthusiasm, and life in their schools and in their communities so much more than made up for it that they would not think of giving it up.

After each conference each teacher went to her school loaded with material and with a clear idea as to just what she was going to do in her school.

These conferences were conducted by the county superintendent. Occasionally we took advantage of our unusual opportunity to call in members of the faculty of the State Teachers' College to present some special phase of the work.

The first year we had 5 schools in the work, the second year there were 16; this year there are 35. These teachers are held responsible for attending the conferences and for successfully carrying on the work in their schools.

The agricultural instruction service of the United States Department of Agriculture.—The division of agricultural instruction of the Department of Agriculture, through cooperation with the teachers in service, has done much to encourage agriculture in the rural schools. The nature of such cooperation during the past two years may be described briefly as follows:

1. By furnishing information concerning helpful material for instruction and how it may be used.

2. By emphasizing the value of community surveys and showing how they may be conducted.

3. By encouraging the teachers to follow the home-project plan through boys' and girls' club work.

4. By encouraging the use of lantern slides and moving-picture films and by establishing circuits for the distribution of visual instruction material.

5. By the publication and distribution of bulletins of use to teachers. The lessons on dairying, on potatoes, and on gardening are examples. Other publications furnish suggestions to teachers on how they can make use of certain Farmers' Bulletins published by the department.

6. By cooperation with State departments of education and State agricultural colleges in preparing suggestive outline courses of study in agriculture for elementary schools. Such a course has been prepared for the Ohio elementary schools and one is under preparation for use in the schools of Arkansas.